

Remarks/Arguments:

Applicants thank the Examiner for the opportunity to discuss claim 1 in view of Judice on December 19, 2006.

Specification:

As requested by the Examiner, a new abstract, in narrative form, has now been enclosed.

As requested by the Examiner, the Brief Description of the Drawing has been amended to "Brief Description of the Drawings".

Claim Objection:

As suggested by the Examiner, claims 2-10, 13 and 17-19 have been amended.

Section 112 Rejections:

As suggested by the Examiner, claims 10-11 and 18-19 have been amended to more particularly point out the subject matter of the invention.

Claim 20 has been canceled.

Section 103 Rejections:

Claim 1 has been rejected as being obvious in view of Judice. Applicants respectfully submit that this rejection is overcome for the reasons set forth below.

Claim 1 includes features which are not suggested by the cited reference, namely:

- (a) receiving a frame of pixels ...
- (b) identifying pixels in **the received frame** having scintillation noise;
- (c) modifying ... pixels in **the received frame**, identified as having scintillation noise, to form a **filtered frame of pixels**;
- (d) counting the number of pixels modified in step (c); and
- (e) displaying **the filtered frame of pixels**, if the amount of pixels counted is less than a threshold value.

Applicants note that the method of claim 1 requires that pixels having scintillation noise be identified in **the received frame**. These identified pixels are modified to form a **filtered frame of pixels**. Accordingly, the method includes two different frames, namely, a received frame of pixels and a filtered frame of pixels. The claim further requires that the modified pixels in the received frame be counted. Applicants note that the modified received frame is the same as the filtered frame.

As required by claim 1, if the count of the modified pixels is above a threshold value, the method **does not display the filtered frame** (or the modified received frame), but **displays the received frame** (or the originally received frame).

Judice discloses a buffer controlled dither processing technique. Judice introduces a concept of hysteretic thresholding, which modulates a nominal dither threshold and eliminates scintillation in the image. In FIG. 1 of Judice, there is shown a comparator which compares picture elements (pixels) of a frame to different threshold levels. Based on the comparison, a bi-level output of pixels, which are either on or off, is provided to a user. Whether a pixel is on or off depends on whether the intensity of the pixel of a frame is greater than or less than a threshold level. In accordance with equation (3), Judice discloses that if a selected pixel is off in a previous frame, the threshold is set higher by an amount of "delta". Similarly, when a selected pixel in the previous frame is on, the threshold is set lower by an amount of "delta". With this technique, Judice states that even with a small band of $\delta=2$, the update rate is cut in half and background scintillation is all but eliminated.

Applicants respectfully submit, however, that Judice does **not** perform the step of identifying pixels in a received frame having scintillation noise. Judice changes the thresholding level based on a previous frame and hopes that, as a result, the scintillation is reduced. Nowhere, in the article, does Judice state that he identifies pixels in a received frame having scintillation noise.

Furthermore, Judice does not disclose or suggest modifying those pixels, which have been identified as having scintillation noise, to form a different frame referred to as a filtered frame of pixels. Judice simply changes pixels based on a previously set threshold that changes by "delta".

Further still, applicants fail to see anywhere in Judice where a count is made of the number of pixels that are modified in the received frame.

Lastly, Judice does not have a step of displaying the filtered frame, if the amount of pixels counted is less than a threshold value.

It is respectfully submitted that Judice's method is completely different from the method of claim 1. Judice does not identify pixels in a single frame which need to be modified, because of being identified as containing scintillation noise. Further, Judice does not count the number of pixels which have been modified in that single frame. Further still, Judice does not display the modified frame of pixels, namely the filtered frame of pixels, if too many pixels have been determined to have been counted as having scintillation noise.

Although Judice describes that scintillation noise is annoying and that his technique all but eliminates scintillation noise, Judice does **not count the number of pixels that have been identified as having scintillation noise** in the received frame and have, therefore, been modified to form the filtered frame. Applicants respectfully request that the Examiner reconsider the rejection of claim 1 in view of Judice.

In the Interview Summary of December 19, 2006, the Examiner indicates that claim 1 states that the counter is used only for displaying purposes and not for the modification step. Furthermore, the Examiner states that a counter does exist in the prior art, by using FIG. 6 of Judice. Applicants respectfully disagree with the conclusions of the Examiner. Step (d) of claim

1 includes the step of counting the number of pixels which have been modified in the received frame and, if the amount of pixels counted are less than a threshold value, the modified received frame, (namely the filtered frame of pixels) is not displayed but the originally received frame is displayed. Therefore, the counter is used for determining whether the filtered frame of pixels is displayed or not displayed. This is completely missing from Judice.

FIG. 6 of Judice shows cumulative updates versus frame numbers. While it may be true that there is a counter to show the results plotted in FIG. 6, there is no step of counting the number of pixels that are modified in a single received frame of pixels, with the determination to display the modified received frame (namely the filtered frame) if the pixels counted are less than a threshold value. The plots shown in FIG. 6 are simply a by-product, or the result of the technique used by Judice in the selective updating of pixels as shown in FIG. 3. There is no counting step to determine whether to display that modified frame (the filtered frame) or to display the originally received un-modified frame.

Newly Added Claim 21:

Newly added claim 21 further limits claim 1 by requiring that:

- step (d) further includes counting the number of pixels identified in **the same received frame** having scintillation noise, and
- step (e) further includes displaying **the same received frame, if the amount of pixels counted is greater than the threshold value**.

Basis for claim 21 may be found, for example, in the specification at page 6, lines 18-21. As described therein, the method monitors the number of scintillation pixels that are substituted on a frame-by-frame basis. If the substitution count exceeds a threshold, then all pixels substitutions are suspended for one frame.

It is respectfully submitted that the step of displaying the same received frame, if the amount of pixels counted is greater than the threshold value, is not described or suggested by Judice.

Applicants emphasize that claim 21 combined with claim 1 now requires the step of displaying the filtered frame of pixels, if the amount of pixels counted is less than threshold value, and displaying the same received frame, if the amount of pixels counted is greater than the threshold value. This combination is certainly missing from the disclosure of Judice. Favorable consideration is requested separately for claim 21.

Claim 8:

Claim 8 recites the following features:

- (f) setting a number of a suspend threshold;
- (g) comparing the number of the suspend threshold to the number of pixels counted in step (d); and
- (h) **suspending** step (c), if the number of pixels counted in step (d) is larger than the number of the suspend threshold.

Claim 8 further limits claim 1 by reciting that if the number of pixels counted are greater than the suspend threshold, then step (c) of modifying the intensity value of the pixels in the received frame is suspended. Here, is an example of where **the counting step directly impacts the modification recited in step (c)**.

Favorable reconsideration is requested separately for claim 8.

Claims Dependent from Claim 1:

Claims 2-11 depend from claim 1 and are, therefore, not subject to rejection in view of Judice for at least the same reasons set forth above for original claim 1.

Claim 12:

Independent claim 12 has been amended to recite the following features:

- a processor ... for ... (b) modifying intensity values of pixels in **the received frame** identified as having scintillation noise, to form a **filtered frame** of pixels,
- a counter ... for counting the number of pixels modified by... in **the filtered frame** of pixels, and the **display displays the filtered frame of pixels, if the amount of pixels counted by the counter is less than a threshold value**, and ...
- **the display displays the received frame, if the amount of pixels counted by the counter is greater than the threshold value.**

Claim 12 requires that a counter count the number of pixels that have been modified in the received frame. Furthermore, claim 12 requires that the display show the received frame, if the count is greater than a threshold value, and show the filtered frame if the count is smaller than a threshold value.

Applicants note that although not the same, amended claim 12 includes features that are similar to the combined features of claims 1 and 21. These combined features are not suggested by Judice.

Favorable reconsideration is requested for amended claim 12. Dependent claims 13-19 depend from amended claim 12 and are, therefore, not subject to rejection in view of the cited reference for at least the same reasons set forth above for amended claim 12.

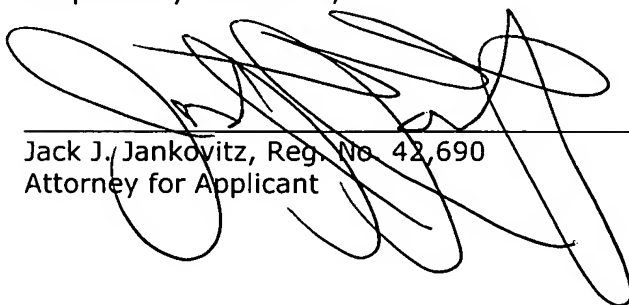
Appln. No.: 10/697,198
Amendment Dated January 11, 2007
Reply to Office Action of November 14, 2006

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Conclusion

The application is now in condition for allowance with claims 1-19 and newly added claim 21.

Respectfully submitted,



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Attachments: Abstract

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ITDE-PNV113US

Abstract

A method for scintillation suppression of video images includes receiving a frame of pixels having intensity values and identifying pixels in the received frame having scintillation noise. The method modifies intensity values of pixels in the received frame, which are identified as having scintillation noise, and forms a filtered frame of pixels. The method counts the number of pixels modified in the filtered frame of pixels, and displays the filtered frame of pixels if the amount of pixels counted is less than a threshold value. The method displays the received frame of pixels, if the amount of modified pixels counted in the filtered frame of pixels is greater than the threshold value.